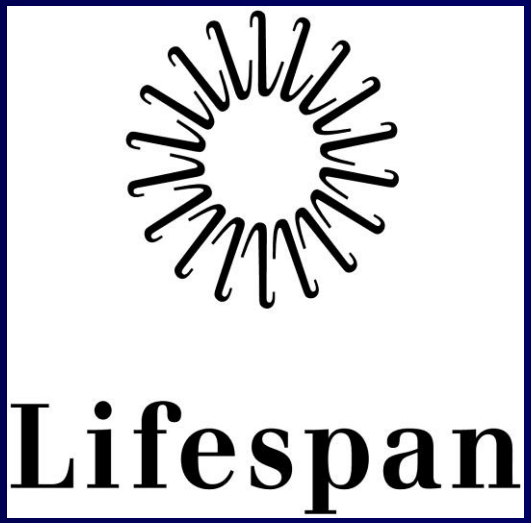
Chronic Dizziness in Older Persons



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Objectives

- 1. Learn epidemiological and clinical features of chronic dizziness in the elderly population.
- 2. Use key history and physical examination data to create a differential diagnosis of chronic dizziness
- 3. Identify and describe the presentation and treatment of the common causes of dizziness in the elderly.

***Case*: Barbara Jones**

Mrs. Jones, 82, complains of dizziness of and on for the last 4-5 months; fallen thrice in the last six months while walking in the house; lives with her daughter who witnessed the falls; No serious injury. Mrs. Jones denies any history of head trauma, nausea or vomiting. Hx of mild memory problems for the past 8-10 months.

***PMH*: Mild bilateral cataracts, coronary artery disease, hypertension, chronic backache, Hearing problem and diabetes mellitus. Using a cane for the past 6-7 months.**

Medications: *Metformin 500 mg twice a day, baby aspirin, metoprolol 12.5 mg. twice a day, nifedipine XL 60 mg. qd, Ranitidine 150 mg. twice a day, Acetaminophen prn, and a multivitamin tablet.*

Questions:

- *1. What is the prevalence of dizziness in older persons?*
- *2. What anatomical structures generally give rise to the type of dizziness reported by Mrs. Jones?*
- *3. What factors related to Mrs. Jones medical history could contribute to her dizziness?*

Chronic Dizziness

- Subjective sensation of postural instability or of illusory motion
- Nonspecific terms that include:
  - Vertigo
  - Spinning
  - Dysequilibrium
  - Feeling woozy
  - Lightheadedness
  - Giddiness
  - Faintness
- Most older persons can not specify one sensation

Prevalence / Morbidity

- Common complaint in persons aged 65 years or >
- Random Sample of 1000 subjects / Dizziness Questionnaire
- > 65 years, living in community
- Results

  Prevalence: 30%

  10% increase in odds of dizziness for every 5yr. > age

  30% greater odds of dizziness in women

Colledge et al. Age and ageing. 1994;23:117-120.

- Associated with an increased risk of:
  - Falls
  - Syncope
  - Functional Disability
  - Depressive Symptoms

Types of Dizziness

- Often categorized on the basis of;
- <u>Duration:</u>

  Acute – Present for less than 1-2 months

  Chronic – Present for more than 1-2 months

- <u>Types of Sensations:</u>

  - Vertigo
  - Dysequilibrium
  - Mixed
  - Presyncope
  - Other

Vertigo

- A spinning or rotational sensation
  a) Patient with respect to the environment
     (subjective vertigo)
  b) Environment with respect to the patient
     (objective vertigo)

- Causes: disturbance within the vestibular system or its connections.

Presyncope

- A feeling of lightheadedness or impending faintness, or a feeling that one is about to pass out
- Usually as a result of hypoperfusion of the brain

  (e.g.: cardiovascular conditions)

Dysequilibrium

- Feeling of imbalance or unsteadiness
- Usually results from abnormalities in proprioceptive system

Other

- A vague feeling other than vertigo, presyncope, or dysequilibrium
- The patient may describe “floating”, “wooziness”, “spaciness”, or “whirling”

Mixed

- Combination of two or more of the above types
- Most common type of dizziness reported by older persons

Mechanisms of Equilibrium

- **Maintenance of balance and equilibrium results from complex integration of sensory information obtained from;**

  Visual System
  Hearing
  Vestibular System
  Proprioceptive system
  Cerebral cortex, Cerebellum, Brain stem

Causes of Chronic Dizziness

- Design - Retrospective chart review
- 116 subjects evaluated for dizziness (>70 yrs.)
- 55% women
- Setting - Neuro-otology clinic
- Standardized questionnaire
- Verbal description of dizziness
- Electronystgmography (ENG)
- CT/MRI/Rotatory testing

Sloane PD, Baloh RW. JAGS. 37:1031-1038, 1989.

Causes of Chronic Dizziness

Results

- **Mean duration of dizziness - 36 months**
- **Specific diagnosis - 100 subjects**
- **Causes:**

BPPV - 26%
CV stroke - 22%
Meniere's disease - 9%
Psychogenic - 9%
Acoustic neuroma -2%
Undetermined - 14%

Sloane PD, Baloh RW. JAGS. 37:1031-1038, 1989.

Discrete Diseases causing Chronic Dizziness

- Vestibular Causes (4-70%)
  - Benign Paroxysmal Position Vertigo
  - Meniere's Disease
  - Recurrent Vestibulopathy
- Central Nervous System Causes
  - Vertebrobasilar ischemia/Stroke
  - Parkinsonism
- Postural Hypotension (4-65%)
  - Causes
  - Postprandial hypotension
- Medications

Discrete Diseases causing Chronic Dizziness (contd.)

- **Systemic Causes**
  - Anemia
  - Hypothyroidism
  - Congestive Heart Failure
  - Diabetes mellitus

- **Psychogenic Causes (0-50%)**
  - Depressive disorders
  - Anxiety disorders
- **Cervical Causes (0-57%)**
  - Cervical spondylosis / osteoarthritis
- **Diseases causing impairment of vision**
  - Cataracts
  - Glaucoma
  - Macular degeneration

Benign Paroxysmal Positional Vertigo

- 4-30%
- Vertigo: Sudden onset provoked by changes in head position (e.g.: Rolling over in bed into a lateral position, Gazing upward, Leaning forward)
- Nystagmus
- Nausea with or without emesis
- Recurrent bouts of positional vertigo over days to months with quiescent periods in between episodes

Pathophysiologic Mechanism

- The presence of free-floating particulate matter, dislodged OTOCONIA in the endolymph of the Posterior Semicircular Canal.

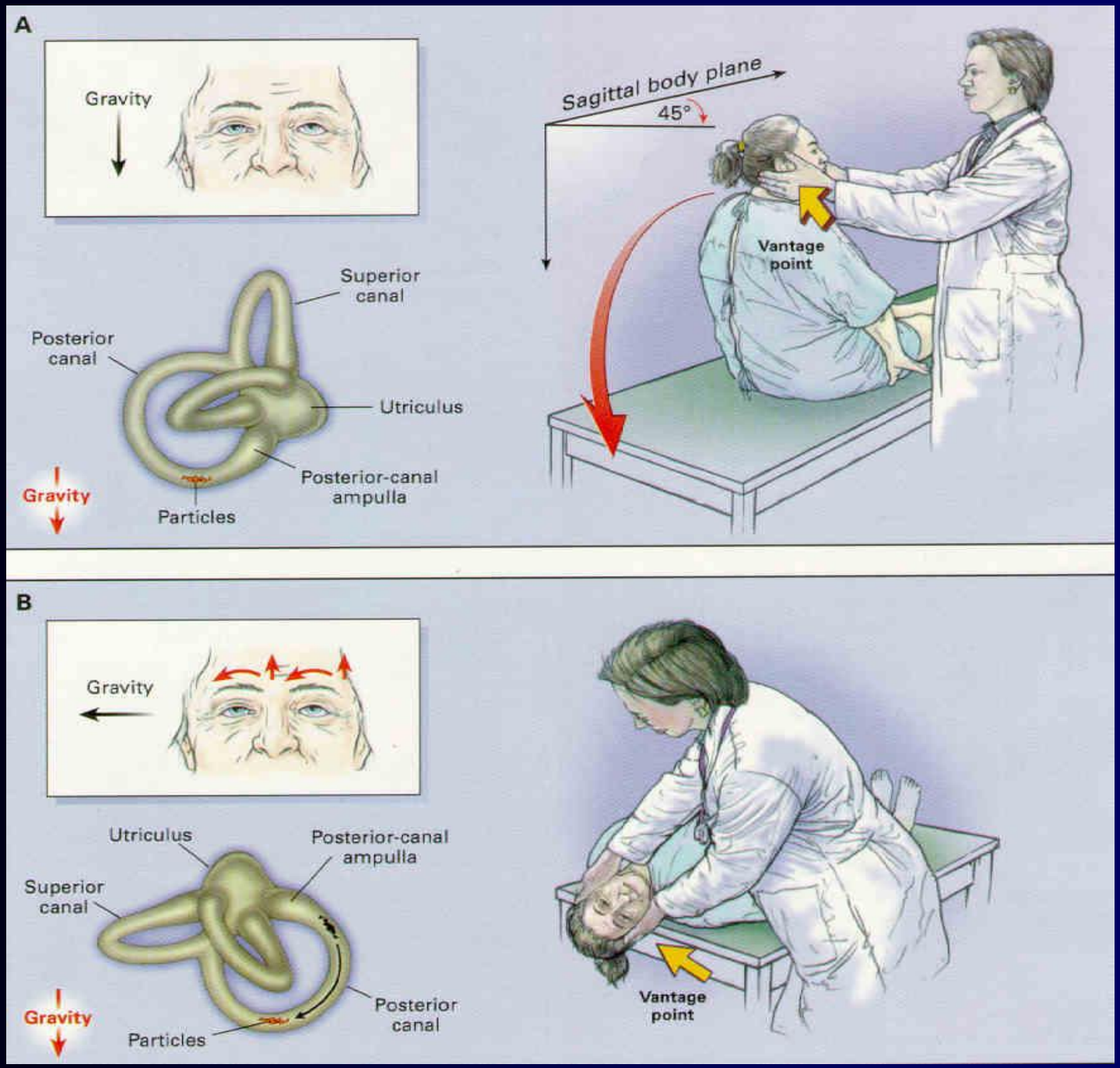
- Movement of the debris causes alterations in endolymphatic pressure which causes vertigo and nystagmus

Definitive diagnosis

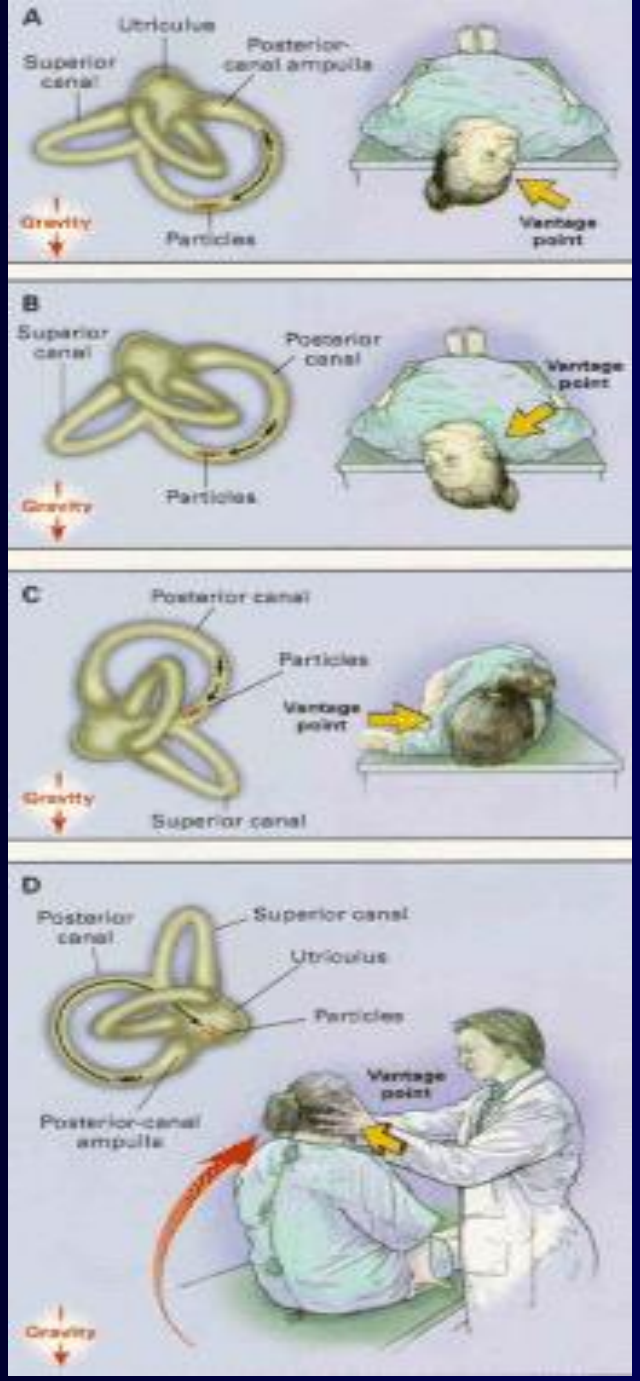
- Dix-Hallpike Test

Treatment

- Epley's Canalith Repositioning Procedure



Furman JM, Cass SP. NEJM.1999, 341;1590-96.



Furman JM, Cass SP. NEJM. 1999;341;1590-96.

Postural Hypotension and Dizziness

- **Postural dizziness (No orthostasis)**
  - **9672 elderly women**
  - **14 % had postural hypotension only 3% dizziness**
  - **16% reported postural dizziness but no orthostasis**

Ensrud KE, Nevitt MC et al. Arch. Int. Med. 1992;152:1058-64.

- **<u>Postprandial hypotension</u>;**

  Orthostatic drop in SBP > 20 mm Hg within 1-2 hours of eating a meal
- Treatment: Small frequent meals

Cervical Causes

- 0-65%
- Cervical spondylosis/ Osteoarthritis
- Worse with head turning or walking on uneven surfaces
- signs of radiculopathy or mylopathy or spastic gait

PROPRIOCEPTIVE MECHANISM

- Overstimulation of proprioceptive receptors in the facet joints

VASCULAR MECHANISM

- Temporary occlusion of vertebral artery by osteoarthritic spur on turning the head

MEDICATIONS

- Anxiolytic drugs
- Antidepressants
- Antihypertensives
- Aminoglycosides
- Chemotherapeutic agents
- NSAIDs
- OTCs - cold preparations

Mechanisms

Anticholinergic, Ototoxicity, CNS actions, Orthostasis

Meclizine

anticholinergic properties and can worsen dizziness caused by nonlabyrinthine disease

Chronic Dizziness (Geriatric Syndrome)

- Dizziness in older persons is usually considered a symptom of one or more discrete diseases
- Combined effects of disorders and impairments in the multiple systems can be responsible for dysequilibrium
- Recent studies suggest the possibility of a multifactorial etiology

Chronic Dizziness as a Geriatric Syndrome (contd.)

- Community sample - 1087 subjects
- Complaint of dizziness - 264 (24%)
- Relative risks of association with dizziness;

Impaired hearing	**1.27**
5 or > medications	**1.30**
Postural hypotension	**1.31**
Impaired balance	**1.31**
Depressive symptoms	**1.36**
Past Hx of MI	**1.38**
Anxiety	**1.69**

Tinetti ME, Gill TM et al. Ann Intern Med. 2000; 132: 337-344.

Chronic Dizziness as a Geriatric Syndrome (contd.)

- Patients at Geriatric assessment center - 262
- Complaint of dizziness - 54 (21%)
- Association with dizziness (Odds ratio);

Past Hx of MI	**6.6**
Cataracts	**5.3**
Impaired balance	**3.1**
Depressive symptoms	**2.8**
Diabetes	**2.5**
Postural hypotension	**2.0**
3 or > medications	**1.6**

Kao AC, Nanda A et al. J Am Geriatric Soc. 2001; 49:72-75.

Chronic Dizziness as a Geriatric Syndrome (contd.)

- % Patients reporting dizziness according to number of risk factors;

No risk factor	0
one	6%
Two	12%
Three	26%
Four or more	51%

Kao AC, Nanda A et al. J Am Geriatric Soc. 2001; 49:72-75.

Evaluation: Goals

- To identify and eliminate the cause of dizziness
- If not, the goal should be to alleviate dizziness to the extent possible / to avoid adverse consequences, such as:
  - Falls
  - Functional disability
  - Psychological distress
- Try to identify the various factors contributing to dizziness
- Treating one or more of these contributors might help to alleviate the dizziness

Clinical History

- **Frequency and duration of dizziness**

  BPPV — Recurrent; less than 1 minute

  Meniere's Disease — Recurrent; 5 minutes to 24 hours

- **Episodic or continuous**

  BPPV, Meniere's disease, or CNS disorders -- Episodic

  Psychogenic dizziness -- Continuous

- **Associated symptoms**

  Hearing loss (fluctuating - Meniere's, Gradual - Acoustic Neuroma) ear fullness, tinnitus, diplopia, dysarthria, and syncope

Clinical History (contd.)

- **Precipitating or provoking factors**
  - Standing from a supine or sitting position (orthostasis)
  - Rolling over in bed
  - Dizziness while sitting or standing after eating meals (postprandial hypotension)
- **Co-morbid conditions**
  - Cardiac disease, diabetes, anxiety, depression, etc
- **Review of all medications (including OTC)**
- Evaluation for depressive symptoms or anxiety disorders

Case (Barbara Jones)

- *On further questioning about the type of dizziness, Mrs. Jones says sometimes she feels woozy, sometimes spinning or lightheadedness. The episodes usually occur when she tries to stand up from sitting or lying down position. Sometimes she complains of dizziness on change in head and neck position.*

- *She denies any nausea or vomiting; her daughter reports no loss of consciousness during the falls. The patient denies any sensation of fullness in the ears.*

Questions:

- ***1. What should be kept in mind during physical examination?***
- ***2. What are the bedside tests, which can provoke dizziness?***
- ***3. What laboratory tests are helpful in the diagnosis?***

Physical Examination

- Orthostatic changes in blood pressure
- Otoscopic examination:
  Excessive wax or structural abnormalities
- Hearing: Whisper test or an audioscope
- Vision
- Spontaneous Nystagmus
  Peripheral vestibular lesions - Usually horizontal / rotatory
  Central lesions - Vertical
- Detailed Neurological exam.

Provocative Tests (Bedside)

- **Head-thrust test:** To see if Vestibulo-ocular reflex (VOR) is intact. VOR helps to maintain visual stability during head movement.

- **Post-headshake test:**

  Horizontal nystagmus – Unilateral peripheral lesions

  Vertical nystagmus – Central lesions

- **Fukuda Stepping test:**

  Vestibulospinal tract is intact

- **Dix-Hallpike test:**

  BPPV

Lab Evaluation

- Hematocrit
  BUN
  TFTs
  RBC Folate
  Glucose
  Electrolytes
  Vitamin B12

- If a cardiovascular etiology is suspected – ECG
- Holter monitoring and tilt table: only if there is a strong suspicion of Cardiac arrhythmia or unexplained syncope

- Audiogram: Sensorineural hearing loss
  More for lower frequencies – Meniere's disease
  More for higher frequencies – Acoustic neuroma

Specialized Testing

Vestibular Function Tests:

- Electronystagmography
- Rotational Chair test
- Computerized posturography

Neuroimaging

- MRI; Suspicion of CP angle tumors

Barbara Jones

On examination,

HR 82/ minute, supine BP is 116/70 (standing 100/64) and temperature is 98.4 degrees F.

Cardiac, and respiratory system - Normal

Neuro exam.- reveals difficulty in getting up from chair without using arms of the chair. Romberg sign is negative but she is not able to do a one-leg stand secondary to pain in the back. There is no nystagmus at rest or on head thrust test; Dix Hallpike test is negative.

MMSE - 27/30; GDS 3/15.

Differential diagnosis ?

Barbara Jones (Differential diagnosis)

1. Postural hypotension

2. Other contributors

Gait abnormality secondary to backache

Hearing loss

Bilateral cataracts

Treatment ?

TREATMENT

- Directed towards a specific cause
- If the history, examination, and routine lab testing do not suggest a discrete cause, THERAPEUTIC TRIALS are often the best way to determine significant contributors
- Try to ameliorate one or more potential etiological factors

Medical Therapy

- Treatment of individual diseases
- Treatment of anxiety or depression
- Correction of vision/hearing

Medications

- Dosage adjustment
- Elimination/substitution of the offending medication

Vestibular Suppressants

Meclizine and Scopolamine:

- Commonly used for symptomatic patients
- Meclizine – Weak antihistaminic agent **(12.5 to 25 mg PO TID as needed)** Should not be used long term; Suppress central adaptation
- Scopolamine – Should not be used in older persons: Anticholinergic side effects

  Urinary retention **Deficits in cognition**

Vestibular Rehabilitation

- Combinations of exercises involving head and eye movements (while sitting and standing) designed to provoke vertigo
- Movements are repeated until they can no longer be tolerated
- Number of repetitions are slowly increased over 6-8 weeks

Patient Education

- Basic education concerning the functioning of the balance system (alleviates anxiety)

- <u>Modification of Activities</u>:
  - To rise slowly from sitting/supine positions
  - Avoid movements, such as looking up or bending down
  - Avoid walking in the dark

- Cautioned not to habitually avoid other movements, such as head turning, because doing so may compromise central adaptation, thereby exacerbating dizziness

- Avoidance of OTC drugs – Cold preparations

Barbara Jones

Her postural hypotension is most likely secondary to Nifedipine XL. Her blood pressure measured in the office suggests she may not need Nifedipine at all. Her Nifedipine should be discontinued. Her blood pressure should be monitored and if needed, the dose of Metoprolol can be increased.

In addition her backache should be adequately controlled with scheduled dosage of acetaminophen instead of using it as prn. She should also have her vision and hearing tested.

Questions?